Life on the Line

For use with: Arizona Wildlife Views Television Show, 07-08 Season, Episode 6

Human-Environment Interactions; Nature of Science **Time Frame:** 2-3 hours **Grade:** 4-8

Overview:
This video focuses on some of the ways that biologists are helping animals in Arizona. The first segment discusses attempts to restore populations of the endangered Sonoran pronghorn. This is followed by a story about the urban fishing program and the fish that are stocked in these lakes. Finally, it covers efforts to make power lines safer for large birds. Students will have the opportunity to use the knowledge gained from this episode to develop a way to discourage pigeons from perching on walls and buildings.

Essential Questions
- How do biologists manage wildlife populations?
- How can human activities benefit and harm wildlife?
- What place does creativity have in science?

Objectives
- Identify three challenges with bringing animals off of the endangered species list.
- Use common, household materials to prevent pigeons from perching on school walls.

Arizona Department of Education Standards

Science

4th grade	5th grade	6th grade	7th grade	8th grade
S3-C1-PO1 S3-C2-PO3	S3-C1-PO2 S3-C2-PO3	S3-C1-PO3	S3-C2-PO3	S3-C2-PO3

Workplace Skills

4th – 8th grades
3WP-E2-PO3

Materials and Resources
- Copy of Arizona Wildlife Views episode

Teacher Preparation
- Acquire a copy of the television show. You can check local listings to determine when it will air and record it directly. You may also check the Department's web site to see if a copy can be downloaded or ordered.
- Write the vocabulary words and questions on the board.

Background Information:
This is not a lesson plan in the traditional sense. It does not provide step-by-step directions for completing an activity. Instead, it provides information to help you use an episode of the *Arizona Wildlife Views* television program in your classroom. It contains four suggested activities along with extensions and modifications. The first activity focuses on vocabulary. We have provided and defined some of the words used in the video. You are encouraged to use any appropriate strategies to introduce these to your students. Then, there is a series of comprehension questions that students can answer while watching the video. Answers (directly from the video) are provided in italics. Next, the critical thinking questions build on the major concepts introduced in the video. Students need to put a little bit more thought into these questions. Some reasonable

answers are provided in italics. However, teachers should be cautious and realize that students may provide additional answers that can be supported with evidence. Finally, there is an in-depth activity. This activity allows students to evaluate and synthesize one or more of the concepts from the video, perhaps applying it to a new context or utilizing additional skills.

This episode originally aired on PBS (KAET Channel 8) in Phoenix on February 24, 2008. It may also be shown on regional PBS stations or other channels. For additional viewing information or download options, please visit **http://www.azgfd.gov/focuswild**.

Additional information about the topics featured in this episode can be found at:

- ✓ Pronghorn: http://www.azgfd.gov/h_f/game_antelope.shtml
- ✓ Home on This Range?: http://www.azgfd.gov/w_c/research_home_this_range.shtml
- ✓ Fighting Pronghorn Decline: http://www.azgfd.gov/w_c/research_fighting_pronghorn.shtml
- ✓ Urban Fishing: http://www.azgfd.gov/h_f/urban_fishing.shtml
- ✓ APS Wildlife Protection Program: http://www.aps.com/my_community/Environmental/Environmental_10.html
- ✓ Injured, Sick, or Orphaned Wildlife: http://www.azgfd.gov/w_c/urban_injured_sick.shtml

Relevant Vocabulary:

- o Bird of prey – any bird that hunts and kills other animals, also called a raptor
- o Catchment – something used to collect and store water
- o Sub-species – a division of species that may look or act different and occupy a different area
- o Urban – relating to a city

Comprehension Questions:

1. What is the fastest land mammal in North America and how fast can it travel? *Answer: Pronghorn, 60 miles per hour.*
2. When was the Sonoran pronghorn first listed as endangered? *Answer: 1967.*
3. By 2002, how many Sonoran pronghorn were estimated to be left in the United States? *Answer: 21.*
4. How many subspecies of pronghorn are there? *Answer: 5.*
5. Why is it important to have multiple, isolated populations of a species? *Answer: To prevent a single regional event, such as a disease or high predation rate, from eliminating the entire species.*
6. Where do the fish in Arizona's urban lakes come from? *Answer: Other states, such as Arkansas and Colorado.*
7. According to the video, how many lakes are in the urban fishing program? *Answer: 20.*
8. How do birds get injured on power poles? *Answer: They become a conductor of electricity when they spread their wings and both wings touch a wire. Typically, they can stand on one wire without harm.*
9. What are some things APS is doing to prevent birds from being electrocuted? *Answer: They are covering the wires, insulators, transformers and other components of their poles, and moving nests that are near the tops of the poles.*

Critical Thinking Questions:

1. The historical range of the endangered Sonoran pronghorn was throughout the southwestern United States and into northern Mexico. Today, small, isolated populations can be found in Arizona and Mexico. Name three challenges that biologists face if they want to restore this animal to its historical range. *Answer: Habitat fragmentation and destruction is one of the biggest issues facing wildlife today. As more land is converted to developments, there is less wilderness for the animals to move. This is particularly bad for large animals with large ranges, like the pronghorn. The political situation between Mexico and the United States is a challenge. This is most evident along the border, where actions are taken to limit human crossings. Many of these actions could also impact wildlife movement across the border and*

throughout the region. Global warming is being viewed as a larger problem to wildlife. As temperatures increase, animals will need to adapt or face extinction. Funding will always be an issue for endangered species. It takes a lot of money to bring an animal back from the brink. Therefore, it requires a commitment from the citizens of the country. If they don't believe the animal has value, then they will not be interested in providing the funding to help it. And with so many endangered species along with all of the other domestic and foreign issues facing the country, becoming a priority can be a challenge. These are just some of the challenges. Students may come up with others.

2. Small birds, like pigeons and doves, rarely are electrocuted on power lines, despite the fact that they often use them to perch. Why? *Answer: In order to be electrocuted, the birds need to be able to complete the circuit. They do this when they touch two different wires. Larger birds are more likely to do this when they spread their wings and accidently touch one wire while standing on another wire. Smaller birds can safely stand on one wire without being electrocuted. Even if they spread out their wings, they usually are not large enough to touch the other wires.*

In-Depth Activity: Creative Problem Solving

The video described some of the ways that APS is working to prevent birds from being injured or killed on the power lines. Despite the amount of technology today, most of their solutions were relatively "low-tech", using common materials. One of the great aspects of science is that simple solutions created for one purpose can often be modified to solve other problems.

Pigeons are often a problem for major cities. They are common, can bother people, and damage buildings. However, killing all of the pigeons is not necessarily a good idea. It could have dramatic impacts on other animals and plants.

So the city is asking for your help. They want you to use common items found at your house or school and develop a way to prevent pigeons from perching on walls and roofs. Remember what you learned about keeping birds off of power lines. Can this information be transferred to this problem?

Design and build your solution. If possible, test it at your school.

Differentiated Instruction:

Extensions:

- **Technology:** The pronghorn is the fastest land mammal in North America. What do you think is the fastest one in the world? Use the Internet to confirm your answer and to find the answer to the questions that follow. What is the fastest animal in North America? The World? How fast can humans run?
- **Mathematics:** You are the biologist overseeing the breeding of the Sonoran pronghorn. You need to create an enclosure that is 640 acres. However, you want to save money on fencing. What is the least amount of fencing (in feet) you can use and still create a complete enclosure? *Note: one acre is equal to 43,560 feet.*
- **Science:** It is believed that the pronghorn have hollow hair to provide better insulation. This keeps them cooler in the summer and warmer in the winter. Design an experiment using common materials (like straws) to test this hypothesis.
- **Health:** Electricity is not only dangerous to birds. It can be deadly to humans as well. Research the effects that electric shock can have on the body. Be sure to focus on the major organs such as the brain, heart, and lungs.

Modifications:

- Create a student handout with the vocabulary words and questions already provided.
- Provide students with the definitions and have them match them to the appropriate vocabulary words.
- Provide fill-in-the-blank responses for the Comprehension Questions, allowing students to listen for appropriate words to complete the sentences.

Reflection:

Use the space below to reflect on the success of the lesson. What worked? What didn't? These notes can be used to help the next time you teach the lesson. In addition, the Department would appreciate any feedback. Please visit **http://www.azgfd.gov/focuswild** and submit a lesson evaluation.